What is claimed is:

1. A mode converter comprising a silicon waveguide core deposited over a first silicon dioxide cladding layer, the silicon waveguide core polished such that a first end of the silicon waveguide core has a larger cross-sectional area than a second end of the silicon waveguide core.

2. The mode converter of claim 1, wherein the silicon waveguide core comprises a vertical taper.

3. The mode converter of claim 1, wherein the silicon waveguide core comprises a lateral taper.

4. The mode converter of claim 2, wherein the silicon waveguide core comprises an angled top surface and a flat bottom surface.

5. The mode converter of claim 3, wherein the slope of the vertical taper matches the slope of the lateral taper.

6. The mode converter of claim 1 further comprising a second silicon dioxide cladding layer deposited over the silicon waveguide core to provide a symmetric clad.

7. The mode converter of claim 1 further comprising a silicon substrate, wherein the first silicon dioxide cladding layer and the silicon waveguide core are formed over the silicon substrate.

8. The mode converter of claim 1, wherein the second end of the silicon waveguide core has at least one dimension of about 1 μm.

9. A method of forming a mode converter comprising:

depositing a silicon waveguide core over a first silicon dioxide cladding layer; and

polishing the silicon waveguide core such that a first end of the silicon waveguide core has a larger cross-sectional area than a second end of the silicon waveguide core.

10. The method of claim 9, wherein the polishing step includes vertically tapering the silicon waveguide core.

11. The method of claim 9 further comprising tapering the silicon waveguide core laterally using a lithographic mask and etch process.

12. The method of claim 10, wherein the silicon waveguide core comprises an angled top surface and a flat bottom surface.

13. The method of claim 11 further comprising matching the slope of the vertical taper to the slope of the lateral taper.

14. The method of claim 9 further comprising depositing a second silicon dioxide cladding layer over the silicon waveguide core to provide a symmetric clad.

15. The method of claim 9 further comprising forming the first silicon dioxide cladding layer and the silicon waveguide core over a silicon substrate.

16. The method of claim 9 further comprising mode matching the first end to a single mode fiber.

17. The method of claim 9 further comprising mode matching the second end to one of a group consisting of a waveguide device and a semiconductor laser.

18. A mode converter comprising a silicon waveguide core deposited over a first silicon dioxide cladding layer, the silicon waveguide core being tapered using a gray-scale

lithographic mask and etch process such that a first end of the silicon waveguide core has a larger cross-sectional area than a second end of the silicon waveguide core.

19. The mode converter of claim 18, wherein the silicon waveguide core comprises a vertical taper.

20. The mode converter of claim 19, wherein the silicon waveguide core comprises a lateral taper.

21. The mode converter of claim 20, wherein the slope of the vertical taper matches the slope of the lateral taper.

22. The mode converter of claim 18 further comprising a second silicon dioxide cladding layer deposited over the silicon waveguide core to provide a symmetric clad.

23. The mode converter of claim 18 further comprising the first silicon dioxide cladding layer and the silicon waveguide core formed over a silicon substrate.

24. The mode converter of claim 18, wherein the second end of the silicon waveguide core has at least one dimension of about 0.25 μm.

25. A method of forming a mode converter, the method comprising:

depositing a silicon waveguide core over a first silicon dioxide cladding layer; and

using a gray-scale lithographic mask and etch process on the silicon waveguide core such that a first end of the silicon waveguide core has a larger cross-sectional area than a second end of the silicon waveguide core.

26. The method of claim 25 further comprising vertically tapering the silicon waveguide core using the gray-scale lithographic mask and etch process.

27. The method of claim 26 further comprising laterally taper the silicon waveguide core using the gray-scale lithographic mask and etch process.

28. The method of claim 27 further comprising matching the slope of the vertical taper to the slope of the lateral taper.

29. The method of claim 25 further comprising depositing a second silicon dioxide cladding layer over the silicon waveguide core to provide a symmetric clad.

30. The method of claim 25 further comprising forming the first silicon dioxide cladding layer and the silicon waveguide core over a silicon substrate.

31. The method of claim 25 further comprising mode matching the first end to a single mode fiber.

32. The method of claim 25 further comprising mode matching the second end to one of a group consisting of a waveguide device and a semiconductor laser.